

BOOK REVIEWS

ESSAY REVIEW

WHY PEOPLE BELIEVE WEIRD THINGS: PSEUDOSCIENCE, SUPERSTITION, AND OTHER CONFUSIONS OF OUR TIME by Michael Shermer. New York: W. H. Freeman, 1997. Pp. xii + 306. \$22.95 (cloth). ISBN 0-7167-3090-1.

Dr. Michael Shermer founded the Skeptics Society (SS) in Altadena, California, in 1993 and is the editor-in-chief of its publication, started that same year, *Skeptic* magazine. Although it has similar aims, Shermer's group is quite independent from the Buffalo, New York-based Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), founded in 1976, whose publication is *The Skeptical Inquirer (TSI)*. To some degree, membership for the SS grew out of an earlier but disbanded group, the Southern California Skeptics, which had been affiliated with CSICOP, and some SS personnel (most notably magician James Randi) are also associated with CSICOP activities. However, the organizations are not only independent from one another, but they also, to some degree, are in competition with each other for financial support and patronage.

At least on the surface, the SS appears less zealous and less concerned with debunking and bashing of "paranormalists" than is CSICOP, and this stems largely from Shermer's training as a historian of science and his central concern with science education and the teaching of critical thinking. The mission statement published in the front of each issue of *Skeptic* states that although the SS "recognizes the limitations and socio-cultural influences on science," it still (quoting Einstein) regards the scientific method to be "the most precious thing we have."

Even a cursory examination of Shermer's *Skeptic* magazine reveals that it is far more academic in its tone and character than is *TSI*. Whereas *TSI* tends to center on often-fleeting anomaly claims in the tabloids, media, and popular culture, each issue of *Skeptic* is thematic and contains lengthy discourses on current controversies more central to science, including such topics as cosmology and God, evolutionary psychology, Afrocentrism, ecology, AIDS, and conspiracy theories. Whereas *TSI* is usually livelier reading, *Skeptic* seems more interested in depth and scholarship.

In general, the SS has shown far less interest in serious psychical research and parapsychology than has CSICOP. The little attention SS has

given to parapsychology has been to popular culture and media representations in film, on tabloid television, and such targets as telephone psychics (a general area parapsychologist Martin Johnson termed *porno-parapsychology*). Nonetheless, much that Shermer has to say is relevant for parapsychologists who, after all, deal with many things Shermer would characterize as "weird."

How should one approach a book like Shermer's? On one level, it is fun to read and often seems quite reasonable, as it targets many areas where the reader may agree with its author about the follies and errors of human thought. Much that Shermer writes is certainly on target, and at the outset I must emphasize that I agree with him far more than I disagree. His book is part of a genre epitomized by the writings of today's doyen of debunkers, science writer Martin Gardner, who, following earlier science popularizers such as Joseph Jastrow, has sought to inform the public of the vagaries and pretensions of what he sees as "pseudoscience." On a second level, however, Shermer's book presumes to be more than just fun and asks readers to take it seriously for its reflections on the psychology and even sociology of deviant science.

I am not among those who are hostile to debunking. Proper debunking is a noble calling and can make valuable contributions to the public interest. Certainly there is as much bunk out there that needs to be unmasked as nonsense or lies. We can all approve the condemnation of the scams and con games in our society, some of which may be masked as "metaphysics" or "new science." Much that Shermer and other skeptics attack (but that most scientists simply ignore) may seem manifestly silly or even downright stupid. Such cases are all-too-easy targets, and sometimes organized skeptics seem to go after gnats with cannons.

The far deeper problem is how to demarcate genuine scientific effort from that which might properly be termed *pseudoscientific* (cf. Truzzi, 1996). Because Shermer and his organization represent themselves as guardians of rationality and "critical thinking," and because he emphasizes his own credentials as a historian of science, I think it is fair to hold him to a higher standard than one might use in evaluating a journalist (such as Martin Gardner) or a magician (such as James Randi) who often write about such issues more for entertainment than education. So, precisely because I think his book merits a close and serious examination, I first go into some detail examining Shermer's perspective.

SHERMER'S PERSPECTIVE ON SKEPTICISM AND PSEUDOSCIENCE

Defining whether one is a skeptic must, of course, be done relative to some body of alleged "truth" being questioned. Many people who are proponents of the paranormal would also characterize themselves as "skeptics" insofar as they doubt the conventional wisdom of "orthodox" science. So, when someone says he or she is a skeptic, one must always ask

"Skeptical about what?" Also, one must recognize that people vary tremendously in what they choose to doubt. A parapsychologist who believes in telepathy may totally reject psychokinesis, and someone skeptical toward the claims of Immanuel Velikovsky may still be a proponent for claims in cryptozoology.

Of particular importance is that some "skeptics" go beyond mere doubt and engage in active denial. I have termed such critics *scoffers* (or *pseudo-skeptics*) because they assert negative claims rather than express indecision or agnosticism. Scoffers, too, are defined relative to what they deny. Thus, as with skeptics, scoffers can come from different ends of the spectrum of opinion. The history of science has demonstrated that skeptics and scoffers may come from both the left and right.

Shermer notes that "In science, belief should come from positive evidence in support of a claim, not lack of evidence for or against a claim" (p. 56). This statement would seem to indicate that Shermer is a skeptic rather than a scoffer. Yet, as I try to show in this review, I think he ignores this dictum when it comes to many of his own conclusions of disbelief.

Shermer, to his credit, acknowledges that skepticism (doubt) is a two-edged sword and that "One may be skeptical of a belief or of those who challenge it" (p. 8). Skepticism is generally recognized as one of the fundamental norms of science and, as such, is a basic initial orientation that is background for the application of scientific method. Shermer, however, extends this incorrectly when he writes that "Skepticism is a method[,] not a position" (p. 8). After all, even tentative doubt is an orientation, that is, a position, and so is not really a method for inquiry. Shermer reveals his confusion on this when in almost his next sentence he writes that after he "investigated the claims of the Holocaust deniers, I ended up being skeptical of these skeptics." Obviously, his eventual skepticism here describes his position and not the method of his investigation.

Part of the difficulty here may be due to the fact that Shermer's form of skepticism represents not merely doubt but sometimes also includes scoffing or denial. This seems apparent when he describes what he terms the "essential tension" between skepticism and credulity (p. 21). He speaks of extreme skepticism as being "so skeptical that revolutionary ideas pass you by" (p. 22). At that extreme, he is describing what most of us would probably call *dogmatism* rather than skepticism, for such extreme skepticism is surely denial rather than doubt. I think Shermer's central idea here was more clearly described in Thomas S. Kuhn's discussion of what Kuhn (1977) also termed the "essential tension" in science between the forces keeping it an open (anomaly seeking) but also a conservative (dogmatic) system.

Shermer, like many other hard-line skeptics, seems to me to confuse the *paranormal* (which is a naturalistic term referring to what David Hume (1748/1992, p. 68) termed *extraordinary events* and Hume's contemporaries usually called *marvels*) with the *supernatural* (which refers to

forces from outside of the natural order, as when a deity intrudes itself to produce a miracle). This conflation leads to Shermer's (and many other critics before him) inappropriate attempt to invoke Hume's argument against miracles against claims of the merely paranormal (p. 45).

Shermer recognizes that there is an ongoing debate between historians of science who are *internalists* (who see science as generally independent of the rest of culture) and those who are *externalists* (who argue that there are cultural effects on science), and Shermer terms the attempt to resolve this *Pirsag's Paradox*. However, he caricatures the externalists as viewing science entirely as a "nonprogressive, socially constructed, and subjective creation of knowledge" (p. 29). Certainly Kuhn, whom Shermer describes as a leading externalist, did not go that far. Shermer recognizes the need for some compromise between the extremes, and he even quotes his mentor Richard Olson's wry observation that "In many ways science has merely justified the successive substitutions of modern myths for obsolete ones as the basis for our understanding of the world" (p. 30). Shermer then asserts, however, that science can be distinguished from pseudoscience by the progressive and cumulative character only of the former. This displays a lack of knowledge about the actual historical changes within many of what Shermer would term *pseudosciences*, such as astrology, alchemy, and psychological research, all of which have undergone conceptual developments, often shaped by their advocates' empirical discoveries. Shermer, in my reading of his position, pays mostly lip service to the arguments of the externalists but in the end reverts to the internalists' stereotype of science as centrally progressive and cumulative. Shermer thereby ignores that scholars in the humanities have characterized historical developments in many nonsciences as progressive and cumulative, including the arts and even theology. Surely historians of these respective areas would take great issue with Shermer's glib (and remarkably old-fashioned positivistic) statement that "Pseudoscience, nonscience, superstition, myth, religion and art are not progressive because they do not have goals or mechanisms that allow the accumulation of knowledge that builds on the past" (p. 40). Whether artists and other nonscientists succeed in improving on the styles of their predecessors may be debatable, but to assert that nonscientists do not even have goals of cumulative progress implies a blindness to the history of the humanities.

To his credit, Shermer recognizes that there are fundamental problems in scientific thinking, for he notes that theory influences observations, that the observation process can change the observed, and that the kind of equipment used in experiments often determines the results (pp. 46-48). However, he then goes on to ignore any implications of these problems within normal science for how one should define what is truly ordinary or extraordinary; that is, Shermer treats ordinary science as less problematic than it appears to many philosophers of science precisely because they fully appreciate these problems he merely acknowledges. This then

allows Shermer to contrast what he represents as a relatively trouble-free ordinary (paradigmatic) science with protoscience or anomaly-oriented science so that the latter will appear far less plausible (more extraordinary) and even downright "weird." In fact, however, much of this activity is viewed as quite normal among the proponents of minority viewpoints within what I suggest is a much larger mansion of science than the too-cozy bungalow Shermer might prefer it to be.

Shermer asserts that whereas scientists seek to minimize the effects of observation on the observed, pseudosciences do not (p. 46). His example of this, drawn from nuclear physics, seems to me to misunderstand the uncertainty principle as being merely the result of an experimenter effect (rather than a fundamental uncertainty in nature itself, as Heisenberg [Gribben, 1995, pp. 16-17] argued was the case). More important, however, is that this criticism from Shermer overlooks the fact that a major criticism invoked against many paranormalists is that they believe in all sorts of dubious experimenter effects (mind over matter, mind over body, etc.), effects skeptics assert result only from paranormalists' wishful thinking. So, these "pseudosciences" do not *underrate* the impact of observation on the observed, as Shermer states; they probably *overrate* it.

Shermer, as do many hard-line critics, simply dismisses as worthless anecdotal evidence that is uncorroborated from other sources or without physical proof. He boldly asserts that "Anecdotes do not make a science," and his reference to corroborating "other sources" apparently must exclude other anecdotal reports, because he goes on to say "ten anecdotes are no better than one" (p. 48). Most scientists would agree that anecdotal evidence constitutes weak evidence, but it is surely evidence to some degree; after all, social sciences such as anthropology, as well as clinical medicine, are largely based on such evidence. Anecdotal "evidence" is used daily in law courts, where all sorts of distinctions are made to assess its weight. Thus, multiple witnesses, credible witnesses, independent reports, and so on, are all normally weighted into an equation for our judgment on how useful such anecdotal reports should be. In addition, anecdotal evidence plays an important role in science's discovery process, that is, in the formulation of hypotheses to be subsequently tested. To flatly assert that 10 anecdotal reports are no better than 1—especially if those reports are independent, give a common description, and appear to come from credible reporters—is just nonsense. In fact, getting multiple reports is largely the basis for scientific measurement of reliability (separate from the issue of validity). Shermer's assertion is further confounded when one considers that laboratory reports of experiments (which may or may not be accurate descriptions and which may actually never even have taken place, for we all know that fraud has existed within science) are themselves largely anecdotal reports about such experiments. Certainly, anecdotal reports do not make up the whole of science, but to glibly exclude them as an

insignificant (and unnecessary) ingredient in science ignores what scientists actually do.

Shermer calls attention to the use of nonoperationalized and merely scientific-sounding phrases by many pseudoscientists (p. 49). Yet the use of jargon and what has been called *lateral explanation* within science itself is commonplace, so such abuses cannot be taken as a reliable sign of "pseudoscience." For example, anomalous healing based on odd therapies (such as faith healing, homeopathy, etc.) are commonly dismissed by hard-line skeptics as likely the result of a "placebo effect" or a "remission." Yet the exact physiological mechanisms involved in placebo effects and in remissions remain mysterious. One cannot legitimately explain away one mystery merely by invoking another. It is not that I disagree with Shermer's complaint about the use of phony scientific language, but that criticism extends to normal scientists (think of all the complaints one hears about "psychobabble" from psychologists), so it hardly is an exclusive or defining characteristic of "pseudoscientists."

Shermer accurately points out that mere heresy does not equal correctness, but he greatly underestimates the degree to which later-accepted revolutionary ideas in science initially met with dogmatic denials. As a counterexample to show the openness of science, Shermer states that Einstein was not ridiculed and that no one violently opposed his ideas (p. 50). Surely this ignores some very heated derogation of Einstein's ideas in Germany, especially by some Nazi physicists who denounced his ideas as "Jewish science."

Shermer states that for one to "play the game of science" one should get to know the scientists in one's field, exchange data and ideas informally and formally at conferences, and so on (p. 50), but one might then reasonably ask why Shermer seems not to have followed this recommendation in regard to field investigating individuals whom he proclaims to be pseudoscientists. Skeptics who criticize anomaly claims seem notably absent from the annual meetings of the major protoscience groups, such as the Society for Scientific Exploration or the Parapsychological Association, where these ideas are fully presented and debated. I found it significant that at one point Shermer refers to "the two major psychic associations" frowning on "psychic entertainers" (p. 277). I suspect he here confuses psychics with psychical researchers, especially because he fails to name these two supposed "major" associations. If I am correct, Shermer should follow his own advice on how to "play the game of science."

Shermer correctly states that the burden of proof in science is on those making extraordinary claims (pp. 50-51), but he seems not to recognize that this applies to *all* claims made in science, ordinary as well as extraordinary; it also applies to negative as well as positive claims. This is especially important for the field of parapsychology, in which too often a claim that someone may have had an opportunity to cheat gets treated as though that opportunity must have been taken. Similarly, although the

absence of an adequate control in an experiment greatly reduces the weight of any evidence from that experiment, one cannot logically conclude that weakness in a control must have been basis for the anomalous results. Hard-line skeptics too often assume that merely presenting hypotheses about cheating (some of which are themselves implausible and so constitute quite extraordinary claims) is quite enough and forget that they, too, have a burden of proof.

Shermer lists a group of false but often-heard "urban legends" and rumors to point out, correctly, that the ubiquity of stories does not make them valid (pp. 51-52). However, folklorists who collect such stories note that some urban legends may have a factual basis, and although there may just be smoke under the smoke, there sometimes is significant fire. As with his wholesale dismissal of anecdotes, Shermer seems inclined to dismiss all rumors as totally nonevidential. In fact, my impression is that whereas common experience inclines most people to treat a ubiquitous rumor as one likely to contain some kernel of truth, Shermer seems to conclude the opposite: that its being widespread means only that it must be broadly wish fulfilling.

Shermer contends that failures get rationalized in pseudoscience while their importance "cannot be overemphasized" in good science (p. 53). In the first place, this ignores the existence of internal criticism within and between deviant sciences. In fact, the major exposures of fraud in psychical research have been produced by fellow psychical researchers, not outside critics. Similarly, the best criticisms in areas such as ufology and cryptozoology come from critics within those protosciences. Furthermore, Shermer acknowledges that negative findings "often are not published" within ordinary science, and studies in the psychology of science have shown that conventional scientists also usually resist falsification of their theories and develop rationalizations. More naively, Shermer states that "scientists are kept in line by the fact that fellow scientists will publicize any attempt to fudge" (p. 53). Again, Shermer here describes his ideal rather than reality, because studies show that whistle blowing not only is often unwelcome within science, but it also is frequently punished.

Shermer correctly asserts that analogies and metaphors do not constitute proof in science, but they are not, as he puts it, "merely tools of rhetoric" (p. 55), because they are important devices in the use of theory construction and the "logic of discovery" within science.

Shermer states that "All critical and scientific thinking is . . . problem solving" (p. 59). This, of course, ignores the important role for what might be called "problem seeing" within science, for a major aspect of creativity in science is recognition of problems others have not spotted. The history of science clearly has shown that many important breakthroughs came not from the search for new answers but from the formulation of new questions.

SHERMER'S AGENDA

Why People Believe Weird Things centers on three separate but related tasks. (a) Shermer tries to help readers to generally recognize and define areas of errant or "weird" belief, which, according to the book's subtitle, includes "pseudoscience, superstition, and confusions." (b) He presents a series of group examples, examining selected beliefs in what he considers to be such weird stuff. Last, (c) he considers what he sees as the psychology of such deviant believers to explain why such claims gain acceptance. I now briefly consider his handling of each of these.

The Nature of Pseudoscience and Weird Stuff I found the most disappointing part of his book, for Shermer is remarkably vague in defining the concepts that are the cornerstones of his analysis. The demarcation problem—how to differentiate between science and pseudoscience—has a long and tangled history, and many philosophers, historians, and sociologists of science consider it not only unsolved but also perhaps a false issue (Truzzi, 1996). Despite Shermer's professional background, he seems remarkably unconcerned about detailing the complex boundary issues involved and largely sidesteps the problem with what amounts to a kind of hand waving.

Shermer looks at both pseudoscience and pseudohistory. He defines the former as "claims presented so that they appear scientific even though they lack supporting evidence and plausibility" (p. 33) and the latter as "without supporting evidence and plausibility and presented primarily for political or ideological purposes" (p. 35). In both cases he refers to an absence of supporting evidence, which, of course, proponents of these "pseudosciences" would dispute. Also, because this definition ignores that evidence usually varies in weight, it tends to dismiss weak or inadequate evidence as "no evidence." The key problem, however, centers on Shermer's criterion of "plausibility," because he offers readers no objective basis for what is to be viewed as "plausible." It would seem that for Shermer "weird" things are implausible things, but the history of science is full of what have been considered "crazy" ideas, and one reads regularly about so-called quantum "weirdness" in modern physics. In fact, Niels Bohr reportedly once rejected a proposed idea, saying that the theory suggested by his student was "crazy, but not crazy enough."

Shermer answers his own question—"what is a weird thing?"—only near the end of his book, and he offers the following answer:

I have no formal definition. Weird things are like pornography—difficult to define but obvious when you see them. Each claim, case, or person must be examined individually: One person's weird thing might be another's cherished belief. Who's to say?

Shermer then goes on to say: "Well, one criteria [*sic*]—the criteria of choice for me and millions of others—is science" (p. 274). This argument

clearly is circular, because science is to tell us what is to be considered legitimate science. It also seems to me that Shermer's comparison of "weird things" with pornography is evidence not only of a conceptual indecision but also a pejorative attitude toward the weird.

Finally, a question must be raised about Shermer's idea of "pseudohistory," which he describes as going beyond pseudoscience in that it also is "presented primarily for political or ideological purposes" (p. 35). Surely the motivations for discovering or presenting "facts" is independent from the validity of those facts. Bringing in an imputation of motives as relevant here is really a form of *ad hominem* argument. Many scientific as well as pseudoscientific ideas have been both promoted and dismissed for ideological reasons, and the same is surely also true for the study of history (which presumably is one of the social sciences).

THE CASE EXAMPLES

Many of the sections in Shermer's book first appeared as essays in *Skeptic* magazine. The case studies selected seem to have little conceptual or systematic basis for their inclusion other than that Shermer can call them all "weird things." Therefore the result is itself a "weird" package, because Shermer's selections seem arbitrary and without clear analytic purpose. The major topics Shermer discusses include: Edgar Cayce, near death experiences (NDEs), alien abductions, witch hunts and false accusations, Ayn Rand's objectivism, creationism versus evolutionism, Holocaust denial, race and racism, and Frank Tippler's anthropic principle and physics of immortality. The selection seems almost random.

Overall, Shermer presents readers with interesting examinations of these topics, and he makes a good case for his skepticism toward them. I will not try to summarize his discussions here, and I do recommend them as worthwhile to those interested in his subjects. However, throughout his book Shermer occasionally goes well beyond what I think can reasonably be concluded. For the remainder of this section of my review, I comment on what I think are those excesses.

On Cold Fusion

Shermer refers to the "cold fusion fiasco" as a classic example of the science system's swift exposure of error" (p. 21) when in fact there remain serious scientists who currently contest that this "exposure" is itself erroneous (for examples, see issues of Eugene Mallove's magazine *Infinite Energy* and Charles Beaudette's *Excess Heat & Why Cold Fusion Research Prevailed*).

On Ghosts

Writing on survival, Shermer glibly asserts: "Shouldn't we know by now that the laws of science prove that ghosts cannot exist?" (p. 27). Shermer

does not specify what these supposed "laws" are, and most philosophers of science would insist that scientific laws are merely probabilistic and so cannot be invoked to assert empirical impossibilities in this fashion.

Shermer goes on to write that "Ghosts have never been successfully tested against external reality" (p. 33) and that they "can be considered nonfactual because they have never been confirmed to any extent" (p. 33). Obviously, Shermer here invokes his own subjective standard for what constitutes a "successful test against external reality," and his is one that simply denies evidential status to anecdotal reports even if they are from credible and multiple witnesses. Furthermore, his assertion of a universal absence of *any* confirmation of ghost reports simply ignores a vast array of evidence that may be weak or faulty but hardly can be said to not exist. In any case, as the logical dictum goes, absence of evidence does not constitute evidence of absence. Here, as throughout much of his book, Shermer leaps from what may be proper doubt (based on nonproof) to logically improper denial (with inadequate basis for active disproof).

On Witch Crazes

Shermer's use of what is purely a descriptive "feedback loop model" (pp. 100-113) to describe the witch craze is perhaps conceptually useful but is fundamentally not explanatory (predictive) and, if one invokes Shermer's own (essentially positivistic) demands for proper scientific thinking, it can be characterized as pseudosociology.

On Objectivism

Shermer's description of Ayn Rand's objectivism as containing "much in it to admire" (p. 122), and his admission that "I accept much of Rand's philosophy" while rejecting her absolute views on ethics, is perhaps revealing. In the first place, objectivism has been severely criticized on many grounds other than its being "a cult of personality," and it is no accident that Rand is seldom (if ever) included in serious surveys of modern philosophy. Of even more interest, however, may be the oddity that Shermer admires an extreme libertarian view such as Rand's, which is a version of social Darwinism, while he also expresses concern for protecting the masses from superstition. Rand is usually associated with the view that society is self-correcting in the economic sphere and so demands a laissez-faire approach and support for an elite in capitalism. Yet many who do not believe in Adam Smith's "invisible hand" as a natural corrective in the economic sphere do believe that properly working science is self-corrective (as, I think, does Shermer). It therefore seems a bit paradoxical that many libertarian skeptics, some of whom are even against government intrusion into medicine as well as commerce, seem so interested in protecting the public from pseudo or junk science. I doubt that Ayn Rand was much concerned with saving the stupid among us from believing in weird things.

On Edgar Cayce

Although it is hardly a bastion of the best efforts in parapsychology, Shermer discusses the Association for Research and Enlightenment as though it represented serious psi research (pp. 65-72). Aside from that problem, Shermer seems unaware of published criticisms of Edgar Cayce by other psychical researchers (including an unsuccessful visit to Cayce by J. B. Rhine) and even by the association's own publication of Edgar Evans Cayce's and Hugh Lynn Cayce's *The Outer Limits of Edgar Cayce's Powers* (an action contradicting Shermer's claim that pseudoscience's failures get buried or rationalized away).

On NDEs

Shermer dismisses NDEs as "hallucinatory wishful-thinking" (p. 78), completely ignoring NDEs that report Hell-like experiences. And although some details reported by patients of their surgery may be conversions of verbal descriptions by the doctors at the time of surgery that later get "converted into visual images" (p. 79), that is a hypothesis that NDE proponents insist has been falsified in many instances.

On the one hand, Shermer asserts that "NDE's remain one of the great unsolved mysteries of psychology" (p. 82), but he also leaps to the conclusion that NDEs must either be a phenomenon within the brain or proof of immortality. This simplistic dichotomy allows Shermer to define NDEs as a "Humean question" of miracles (p. 82) when, in fact, there could be paranormal and nonsupernatural explanations possible (such as that the out-of-body experience might be an emergent phenomenon but one that would not survive the complete death of its generating brain).

On Extraterrestrial Visitors

Because claims of extraterrestrial visitors to earth are not defined as either supernatural or even paranormal by most who espouse those claims, Shermer's invocation of Hume's argument on miracles against extraterrestrial visitors (p. 90) seems particularly inappropriate.

Shermer characterizes the supposed alien autopsy film as "the best physical evidence ever presented for the alien encounter case" (p. 94), yet this film was shown to be fraudulent by leading ufologists and certainly is not even considered "good evidence" within the serious UFO subculture. To characterize it as "the best physical evidence" sets up a straw man.

On Science and Religion

Although he blurs the difference when dealing with many topics, Shermer recognizes the importance of distinguishing between doubt and denial when it comes to theology, for he clearly states that he, like Darwin, is an agnostic and "not an atheist" (p. 136).

Shermer lists three approaches to the relation between science and religion (p. 137-138), and it seems in this section (for he does not tell readers explicitly) that he subscribes to (or at least is sympathetic with) the middle or "separate worlds" model of Darwin and Stephen Jay Gould that contends that science and religion do not overlap or conflict and should be able to coexist (a position unlike the conflicting-worlds model of both atheists and creationists). His own position becomes unclear, however, for near the end of his book he contends that "scientists and secular humanists have good answers" to such questions as "Why be moral? What's the basis for ethics? What is the ultimate meaning of life? [And] What's the point of it all?" (p. 277). Also, he expresses the hope that human intelligence, combined with compassion, can solve our myriad problems and enhance the quality of each life; hope that historical progress continues on its march toward greater freedoms and acceptance for all humans; and hope that reason and science, as well as love and empathy can help us understand our universe, our world, and ourselves (p. 278).

These last remarks suggest that Shermer's own position may actually fall into the "single-worlds model" (p. 137) that, ironically, he describes as characterizing the "pseudoscientific" position of Frank Tipler.

On Tipler, the Anthropic Principle, and Immortality

Shermer argues that Frank Tipler's theory of a purposeful universe is not "radical" but "ultraconservative" (p. 260), because Tipler reaffirms traditional religious ideas. Obviously, radical ideas often can be culturally reactionary, and their "radical" character must be judged relative to the body of knowledge they challenge. Tipler's theory may be conservative relative to theology, but it is certainly radical in relation to the community of physicists to whom Tipler is addressing his theory.

In discussing Tipler (who characterizes his own religious views as agnostic), Shermer practices a bit of rather dubious psychohistory by invoking a highly controversial birth order theory put forward by Frank Sulloway (1996) to explain, at least in part, Tipler's viewpoint. This is ironic, because some reviewers have characterized Sulloway's book as representing a form of pseudoscience.

Shermer is probably correct in warning readers that they should be suspicious of theories that are wish fulfilling. However, he surely goes too far when he writes "When a theory seems to match our eternal hopes, chances are that it is wrong" (p. 268). After all, cannot this same likelihood of error be charged against Shermer's own optimism (quoted above) about eventually being able to answer the fundamental philosophical questions of morality and meaning?

Finally, when Shermer writes "No matter how rational, an if-then argument without empirical data to support each step in the argument is more philosophy (or protoscience or science fiction) than it is science" (p. 269), it may fit Shermer's own wish fulfillment to use this argument

selectively against Tipler, for he could just as well deploy it against Stephen Hawking and against the theories of many other more orthodox cosmologists and even particle physicists (that John Horgan [1996], in his book, *The End of Science*, pointed out seem to be nonfalsifiable).

On Creationism Versus Evolutionism

Shermer presents readers with 12 "philosophically based" and 13 "scientifically based" arguments made by creationists against evolutionary theory. Unfortunately, all of these are arguments as worded by Shermer and are given to readers without explicit quotation from, or source citations of, the literature of creationists. Although as a fellow evolutionist I am inclined to accept Shermer's descriptions of the creationists' arguments, some readers might wonder whether these positions are fairly stated and whether they truly represent the strongest positions of his opponents. It is, after all, much easier to win a debate when one is writing the script for both sides.

Even within this self-constructed dialogue Shermer offers some strange defenses of his own position. For example, he writes that "as soon as the creation of even one species is attributed to supernatural intervention, natural laws and inferences about the workings of nature become void. In each case, all science becomes meaningless" (p. 143). This is a variation on his earlier statement criticizing the evolution deniers, in which he wrote that "once you allow divine intervention into the scientific process, all assumptions about natural law go out the window, and with them science" (p. 132). Because many scientists—Newton, to cite an obvious case—allowed miracles a place in their total outlook, such wholesale disallowance of any external intervention into a scientific natural order is hardly logically necessary or intellectually required. Such rigid and uncompromising rhetoric by Shermer and many other evolutionists may be counterproductive, for it bolsters some creationists' contention that it is the evolutionists who are the dogmatists in this debate.

Similarly, Shermer confusingly writes "Sometimes tautologies are the beginning of science, but they are never the end" and goes on to contend that "Gravity can be tautological, but its inference is justified by the way this theory allows scientists to accurately predict physical events and phenomena" (p. 143). Here he seems to completely misunderstand, for tautologies are statements true by definition and so are quite incapable of empirical refutation or prediction (insofar as a prediction in science must be empirically falsifiable).

Shermer recognizes that much of the debate with the creationists is more political than scientific, and he acknowledges that the Supreme Court battle with the creationists was won politically rather than philosophically (p. 172). Shermer even quotes Stephen Jay Gould's admission that Gould can only tie but not win in debates with the creationists (p. 153). This suggests to me that Shermer and other advocates of evolutionism may

need to pay greater attention to the rhetoric they use, for this truly is a public debate in which semantics plays an important role.

Just as the courts seek to legally define what constitutes "science" in the curriculum, they focus on what legally constitutes "religion." Shermer flatly asserts that "Religion has something to do with the service and worship of God or the supernatural" (p. 145). However, it is important in this context to note that this is very much at odds with most of today's sociologists, who define religion functionally and not substantively and recognize that it often does not involve the supernatural at all. Some creationists have, in fact, argued that a dogmatic secular humanism (or a Scientism like Shermer's) that supports the exclusive teaching of evolution may itself constitute a religion. The outcome of this fight may well hinge on such details in their judicial rather than purely scientific meanings.

So-called "creation science" certainly does not (in the main) represent a positive and progressive research program that many skeptics (following philosopher of science Imre Lakatos) demand of a real science. But I think Shermer and other critics may have overlooked or underestimated the value of creationism for science as a purely negative research program. Because the creationists are almost exclusively interested in criticizing the evolutionists' theories, they do perform the function of a watchdog to help evolutionists "stay honest." After all, the creationists' demand that evolutionists must prove their claims beyond a reasonable doubt echoes many hard-line skeptics who call for a similar hard standard of proof from paranormalists. After all, one needs to remember that, from the point of view of many creationists, evolution constitutes an extraordinary claim that requires extraordinary proof. For most Christian fundamentalists, belief in man's kinship with apes seems a very implausible "weird thing." Creationism may not be a science but, at least to some degree, it may perform a useful function for science.

On Holocaust Denial

Shermer dedicates three chapters to this subject, the most extensively examined one in his book. Although his concern here is with pseudohistory, and he is a trained historian, Shermer seems unconcerned about the extensive and relevant historiography dealing with other examples of revisionism and the broader issues of evidence and pseudohistory (as in such standard works as David Hackett Fischer's (1970) *Historian's Fallacies*, Eric Hobsbawm's and Terrence Ranger's (1983) *The Invention of Tradition*, or Robin W. Winks's (1969) collection *The Historian as Detective: Essays on Evidence*). Shermer discusses pseudohistory as though the topic were new to historians and one without intellectual parallels.

Shermer acknowledges that the Holocaust deniers do not constitute a homogeneous group held together by the Institute for Historical Review (p. 193). Yet he consistently refers to all Holocaust revisionists as

"deniers" even though they vary substantially in their degrees of doubt and denial. Many Holocaust revisionists portray themselves as skeptics who might well agree with Shermer's own guidelines about critical thinking, which they might claim they are using in attacking conventional history.

Perhaps most troublesome is Shermer's failure to distinguish between antisemitism and anti-Zionism (for he treats them as though they were equivalent; p. 198). He seems to lump all critics and revisionists of standard Holocaust history (whether they come from the political right or left and including even some Jewish scholars) into his own stereotype of so-called "Holocaust deniers." Shermer seems unwilling to grant that any revisionists may actually only be interested in ascertaining the historical truth. At one point, Shermer grants that "not all deniers are the same" but then goes right on to say "that in all Holocaust denial there is a core of racist, paranoid, conspiratorial thinking that is clearly directed at Jews" (p. 210). Because Shermer here lumps together all the revisionists, whether they be mere doubters or fanatical deniers, overgeneralization through such a stereotype violates the same rules for critical thinking Shermer advocates elsewhere.

Although I am personally inclined to believe with Shermer that Hitler was aware of and even welcomed genocide for the Jews, the many quotes Shermer puts forward as "proof" that Hitler ordered the Holocaust (p. 218) are unconvincing against a legal standard of "beyond a reasonable doubt" of the sort on which Shermer would probably insist before he accepted the claims for many of the "weird things" he elsewhere examines in his book.

As with most "extraordinary claims," the standard used for assessment will depend on how "extraordinary" the claim is judged to be. Whereas Shermer (and I, too) find the claim that Hitler ordered the Holocaust hardly extraordinary at all, this view is questioned by many historians (and not just Holocaust revisionists) who insist that Hitler's influence was probably more indirect. My concern here is not with the question of whether Hitler ordered the Holocaust; my point is that Shermer violates his own rules for critical thinking when he turns his attention to the skepticism of the Holocaust revisionists.

For example, in discussing Paul Rassinier's number estimate for the genocide (p. 234), Shermer points out that Rassinier's figures must be incorrect because they do not agree with others' estimates, but he does not tell us how Rassinier arrived at his figures. Whether right or wrong, Shermer here argues purely from authority, and I doubt he would permit that kind of argument from his opponents.

One of the most interesting things for me in his book was Shermer's comparison of creationism and Holocaust deniers in terms of the stages they and other fringe groups may go through in seeking public legitimacy (p. 207). In proposing a standard pattern in which groups tone

down their extreme views as they seek to enter the mainstream, Shermer seems to see these changes mostly as adjustive and protective, whereas I think others could view them as welcome improvements.

On Race and Racism

In his discussion of race and racism Shermer correctly notes the general scientific consensus that "the concept of race is biologically meaningless," and he is aware that "we tend to confound race and culture" (p. 51). Shermer may too easily dismiss some of these cultural variances in relation to patterns of human difference that remain even if one abolishes the term *race*. But he seems to me to go too far in linking much serious (but perhaps erroneous) work on hereditary causes of IQ differences (especially because IQ is itself a controversial construct in psychology) with an underlying racism. Certainly, those he criticizes (such as Charles Pearson, the editor of *Mankind Quarterly*) might cry "foul" and charge that their work is being attacked ad hominem.

Shermer seems to me to muddy the water when he discusses possible hereditary links with sexual preference under the rubric of racism (pp. 248-250). It is ironic, if not troublesome, too, that Shermer's discussion here relies heavily on Alfred Kinsey, whose sex studies have come under severe attack in recent years and have been labeled "pseudoscience" by those critics.

Finally, though I am sympathetic with Shermer's desire to diminish racism, in his discussion of alleged racial differences Shermer points out that the internal variance within racial groups is greater than that between groups (p. 248). This seems to ignore simple mean differences (after all, internal variance is greater within men's and women's groups than between them, but sex differences remain consequential).

WHY BELIEF IN WEIRD THINGS

Shermer properly recognizes what he terms *Spinoza's Dictum*, that one should seek to understand rather than ridicule human actions (p. 61), a statement Shermer quotes as a guiding principle in each issue of *Skeptic* magazine. He repeats this later in his book when he asserts that "the goal of skeptics is not just to debunk claims; it is also to examine belief systems and understand how people are affected by them" (p. 128). This position is refreshing among skeptics and stands in marked contrast to H. L. Mencken's dictum, quoted approvingly by Martin Gardner, that "One horse-laugh is worth a thousand syllogisms." Unfortunately, however, even a cursory glance at most skeptical publications (including, alas, Shermer's *Skeptic*) reveals ridicule to be commonplace and, as I suggested earlier, the terms *pseudoscience* and *weird things* as used by Shermer seem more pejorative than productive of "understanding."

In his book's Prologue Shermer tells readers that his analysis will reveal "three tiers why people believe weird things: (1) because hope springs eternal; (2) because thinking can go wrong in general ways; (3) because things can go wrong in particular ways" (p. 8). I think this list demonstrates a central bias, for it does not include the *possibility* that sound arguments and evidence could convince rational people that some "weird things" might actually be true.

Shermer writes of various "logical problems in thinking" (pp. 55-58), including false reliance on emotive words and false analogies, appeals to ignorance, *ad hominem* and *tu quoque*, hasty generalization, overreliance on authorities, the fallacy of negation, circular reasoning, and the *reductio ad absurdum*. However, Shermer seems blind to the frequent use of these same fallacious arguments by critics as well as proponents. Cognitive psychologists have shown that human error in mental processing and decision making is universal, and probably nobody is immune from such mistakes.

It seems fair to compare Shermer's book with similar, earlier analyses. Books dealing with the psychology of human error (to say nothing of the voluminous relevant literature on persuasion, logical fallacies, and deception) have been numerous, yet Shermer neither mentions nor builds on them. Noteworthy, if only for its similar title, is *How to Think About Weird Things: Critical Thinking for a New Age* by Theodore Schick Jr. and Lewis Vaughn (1985), published 2 years before Shermer's book. But comparisons might also be usefully made with Gustav Jahoda's (1969) *The Psychology of Superstition*, David Marks and Richard Kammann's (1980) *The Psychology of the Psychic*, Stuart A. Vyse's (1997) *Believing in Magic: The Psychology of Superstition*, Thomas Gilovich's (1991) *How We Know What Isn't So*, and, especially, Leonard Zusne and Warren H. Jones's (1989) *Anomalistic Psychology: A Study of Magical Thinking*. A comparison of Shermer's book with the already-existing literature on the question of "why people believe weird things" places Shermer's answer to the question in a clearer—but, I think, diminishing—light.

Shermer fancifully argues that "One may gain transcendence by affecting history" (p. 87), but such a "transcendence" is more a metaphor for immortality (and Shermer has himself described metaphors as merely rhetorical). So this may be a case of his own wish fulfillment, especially given that he elsewhere states that the future (and one's impact on history) is unpredictable (p. 271).

Shermer writes that because "We are free in our ignorance, free in the knowledge that most of the causes that determine us are lost in the past . . . forever, it is in this knowledge . . . that hope springs eternal" (p. 272). This view, which suggests that one's illusion of freedom is based on one's ignorance, seems hardly the basis for hope. One could just as well argue that from this premise, pessimism may spring eternal.

Shermer ultimately concludes that "More than any other, the reason people believe weird things is because they want to" (p. 275). After

reading his book, I suspect the exact same explanation may be given for why Shermer *disbelieves* them.

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MARCELLO TRUZZI

*Department of Sociology, Anthropology & Criminology
 Eastern Michigan University
 Ypsilanti, MI 48197, USA
 truzzi@toast.net*